ADEQ
Arizona Department of Environmental Quality

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Proposed Arizona State Implementation Plan Revision

Basic and Enhanced Vehicle Emissions Inspection/Maintenance Programs

Air Quality Division

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1.0 Introduction

This document contains revisions to Arizona's vehicle inspection and maintenance (I/M) programs and details recent changes to exempt certain collectible vehicles and motorcycles from the emissions testing program. Also included are analyses of emissions impacts due to the changes and a demonstration that the National Ambient Air Quality Standards (NAAQS) in the Phoenix and Tucson program areas will be maintained.

1.1 Regulatory Background

Inspection and maintenance programs are required in certain areas that do not meet the carbon monoxide (CO) and ozone (O_3) NAAQS with the purpose of reducing emissions and improving air quality. These programs help identify vehicles with excess emissions, provide information to assist with diagnosing malfunctions that cause excess emissions, and require repair of vehicles to bring them into compliance with emissions standards. Arizona established mandatory vehicle emissions inspection and maintenance programs in Maricopa and Pima Counties in 1975. Since establishment of the mandatory programs, there have been several improvements designed to further reduce volatile organic compounds, which contribute to ozone pollution, and carbon monoxide from vehicle emissions to expedite achievement of the NAAQS in the Phoenix 1-hour Ozone and Carbon Monoxide Nonattainment Areas (Maricopa County) and the Tucson Carbon Monoxide Nonattainment Area (Pima County). Among program improvements was the passage of 1993 legislation that authorized the implementation of an enhanced inspection and maintenance (I/M) program in the Phoenix area.

On November 14, 1994, the Arizona Department of Environmental Quality (ADEQ) submitted to the U.S. Environmental Protection Agency (EPA) the *Final State Implementation Plan Revision – Arizona Basic and Enhanced Vehicle Inspection/Maintenance Program*. The Basic and Enhanced Programs were approved by EPA as an element of the Arizona State Implementation Plan (SIP) effective July 7, 1995 (60 FR 22518; May 8, 1995). Subsequent revisions in June 2001, and February 2002, included an increase in the vehicle emissions inspection program area to incorporate high-growth areas adjacent to metropolitan Phoenix, adoption of onboard diagnostic testing, and provisions for a one time only waiver from meeting applicable test standards during a particular test cycle for the life of a vehicle. In addition, Arizona's programs were demonstrated to be more stringent than the federally required programs. These changes were approved by EPA effective February 21, 2003 (68 FR 2912; January 22, 2003).

At the time of the 1994 submittal, the Maricopa County carbon monoxide and 1-hour ozone areas were both classified as "moderate" nonattainment areas. Moderate classifications for either pollutant require a basic I/M program. As noted above, due to rapid population growth in the Phoenix metropolitan area and the difficulty of demonstrating attainment for CO and ozone, the State legislature authorized an enhanced I/M program for the Maricopa County nonattainment area. This action implemented measures to aid the State in meeting federal requirements for demonstrating reasonable further progress to reduce by 15%, emissions of volatile organic compounds (63 FR 28898; May 27, 1998). The Maricopa County carbon monoxide and 1-hour ozone nonattainment areas were subsequently reclassified to "serious" on August 28, 1996 (61 FR 39343; July 29, 1996) and February 13, 1998 (62 FR 60001; November 6, 1997, and 63 FR 7290; February 13, 1998), respectively. This action triggered a federal requirement for the already implemented enhanced I/M program. The enhanced I/M program is among the primary control measures used to help the Phoenix area attain and maintain the 1-hour ozone and carbon

monoxide air quality standards. Following several years of monitored air quality data meeting the standards and submittal of maintenance plans, the Phoenix area was redesignated to attainment for carbon monoxide on April 8, 2005 (70 FR 11553; March 9, 2005, and 70 FR 52926; September 6, 2005) and redesignated to attainment for the 1-hour ozone standard on June 14, 2005 (70 FR 34362; June 14, 2005).[1]

Arizona's enhanced I/M program is currently operated in the expanded Phoenix metropolitan area, known as Area A, located in portions of Maricopa, Pinal, and Yavapai Counties, and requires periodic emissions inspection of motor vehicles and motor cycles registered or regularly operated within the area.[2] In 1997, EPA completed an analysis of the 1-hour ozone standard and adopted a new more stringent 8-hour standard, which better protects the public from longer periods of exposure to ozone. On June 15, 2004, EPA designated the Phoenix area including much of eastern Maricopa County and Apache Junction in Pinal County nonattainment for the new standard (69 FR 23857; April 30, 2004). Although the 1-hour ozone standard no longer applies for an area one year following the effective date of the area's designation for the 8-hour standard, certain 1-hour nonattainment and maintenance obligations, including continued operation of I/M programs, are required under the anti-backsliding provisions of EPA's 8-hour ozone Phase I implementation rule (69 FR 23951; April 30, 2004).

In Pima County, the Tucson Air Planning Area, known as Area B, was designated as a "not classified" carbon monoxide nonattainment area at the time of the 1994 SIP revision (56 FR 56716; November 6, 1991).[3] The basic I/M program is among the primary control measures used to help the Tucson area attain the carbon monoxide air quality standards. The area is currently in maintenance status following redesignation to attainment on July 10, 2000 (65 FR 36353; June 8, 2000).[4] The Tucson area is in attainment for the ozone NAAQS.

1.2 Revisions to Arizona's I/M Programs - 2005

In 2005 the Arizona Legislature passed House Bill 2357, which amended Arizona Revised Statues (ARS) § 49-542 to authorize the exemption of certain collectible motor vehicles and motorcycles from being subject to emissions testing requirements (see Appendix A). Specifically, the legislation exempts from testing in Area A and Area B, vehicles that are at least fifteen years old or are of a unique or rare design and carry collectible vehicle insurance that restricts the mileage or use of the vehicle. In addition, motorcycles in Area B were exempted from testing.

Prior legislation required ADEQ to conduct an analysis to examine the impacts of exempting certain motor vehicles and motor cycles from the I/M programs (see Appendix B). The analysis evaluated impacts of exempting vehicles 25 model years old or older, motorcycles, and collectible vehicles. The analysis showed that the testing and repair of all 25 model years old or

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[1] See *Final Serious Area Ozone State Implementation Plan for Maricopa County*, December 2000, and *One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area,* March 2004, and *Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area*, March 2001, and *Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area,* May 2003.

[2] See ARS § 49-541(1).

[3] See ARS § 49-541(2).

[4] See *1987 Carbon Monoxide State Implementation Plan Revision for the Tucson Air Planning Area* and *1996 Carbon Monoxide Limited Maintenance Plan for the Tucson Air Planning Area*.

older vehicles provided a significant air quality benefit. The analysis also showed that testing and repair of collectible vehicles in Area A and Area B and motorcycles in Area B does not provide a significant benefit and does not interfere with continued attainment of the CO and ozone NAAQS. Therefore, the statute as revised by HB 2357 only authorizes the exemption of collectible vehicles and motorcycles as described above.

The changes to ARS § 49-542 are self implementing and become effective upon approval by EPA as a revision to the SIP. Subsequent conforming changes to the Arizona Administrative Code (AAC) to reflect the collectible vehicles and motorcycle exemptions will be accomplished in a future rulemaking.

2.0 I/M Program Revision – General SIP Approach

As noted above, Arizona's programs were approved as meeting the federal program requirements most recently on February 21, 2003. The Arizona I/M programs include a number of elements that are more stringent than the minimum federal program. Among these elements are requirements for a one-time-only waiver, expanded I/M implementation area, and waiver denials for gross emitters (see ARS § 49-542(X)). Following implementation of the current program changes, the basic and enhanced programs will continue to meet or exceed the minimum federal requirements. Applicable exemption and compliance enforcement requirements and an assessment of impacts due to the current program changes are described in section 2.1 below.

Revisions to SIP-approved control measures must also not interfere with any applicable requirement concerning attainment and reasonable further progress, or any other applicable requirement of the Clean Air Act (CAA) as outlined in CAA § 110(l). The analyses in section 2.2 demonstrate that exempting collectible vehicles and motorcycles from Arizona's I/M programs will not interfere with attainment of the NAAQS or other applicable requirements of the CAA.

2.1 Basic and Enhanced Program Requirements

Requirements for basic and enhanced I/M programs are detailed in 40 Code of Federal Regulations (CFR) 51.350 through 51.373. The current revisions to the Phoenix and Tucson I/M programs affect applicable requirements related to vehicle coverage and exemptions as well as compliance enforcement procedures.

2.1.1 Vehicle Coverage/Exemptions

Federal regulation 40 CFR 51.356 requires that the SIP include "a description of any special exemptions which will be granted by a program, and an estimate of the percentage and number of subject vehicles which will be impacted. Such exemptions shall be accounted for in the emission reduction analysis."

Table 1 illustrates the number of motorcycles and collectible vehicles relative to the total tested fleet in Maricopa and Pima Counties.

Table 1: Tested Fleet Characteristics for Calendar Year 2003[5]		
Tested Fleet Segment	**Number**	**Percent of Tested Fleet**
Maricopa County (Area A)		
Total Tested Fleet	825,812	100%
Collectible Vehicles (estimated)	3,800	0.05%
Pima County (Area B)		
Total Tested Fleet	373,734	100%
Collectible Vehicles (estimated)	1,400	0.4%
Motorcycles	6,240	1.7%

Basic and enhanced I/M programs as outlined in the CFR are not required to test motorcycles. Because an analysis of the Area A I/M program showed that the testing and repair of motorcycles provided a significant air quality benefit, however, motorcycles will continue to be tested in the Phoenix area (see Appendix B). The analysis also showed that the exemption of motorcycles in the Tucson program area does not provide a significant benefit or adversely affect maintenance of the CO NAAQS. Motorcycles comprise only 1.7 percent of the total tested fleet in Pima County.

Similarly, collectible vehicles total only 0.05 percent of the total tested fleet in Maricopa County and 0.4 percent of the total tested fleet in Pima County. Analysis also showed that given the relatively small number of vehicles and restricted use, testing and repair of collectible vehicles in Areas A and B does not provide a significant benefit and does not adversely affect maintenance of and attainment for the CO and ozone NAAQS.

The emissions impacts due to exemption of collectible vehicles and motorcycles are discussed in Section 2.2.

2.1.2 Compliance Enforcement

Federal regulation 40 CFR 51.361 requires that compliance for enhanced programs generally be ensured through the denial of motor vehicle registration. Specifically, "The SIP shall provide information concerning the enforcement process, including: A description of the existing compliance mechanism if it is to be used in the future and the demonstration that it is as effective or more effective than registration-denial enforcement; An identification of the agencies responsible for performing each of the applicable activities in this section; A description of and accounting for all classes of exempt vehicles …" ARS § 49-542(D) and AAC R18-2-1007 require that no affected motorist can obtain a vehicle registration without demonstrating that the vehicle has completed a vehicle emissions inspection. The State is able to verify emissions compliance by checking an up-to-date computer database produced directly from contractor testing data.

To register a vehicle, owners are also required to obtain liability insurance for that vehicle. Proof of insurance is transmitted to the Arizona Department of Transportation, Motor Vehicle Division (MVD) by the respective insurance companies. This mechanism will be used to track the exemption eligibility of collectible vehicles. The amendments to ARS § 49-542 authorize exemption from I/M testing only for vehicles that that are "maintained primarily for use in car club activities, exhibitions, parades or other functions of public interest or for private collection

[5] See Appendix B, *Report on Potential Exemptions from Vehicle Emissions Testing for Motorcycles, Collectible Vehicles and Vehicles 25 Model Years Old and Older*, December 2004.

and is used only infrequently for other purposes" and "a collectible vehicle or classic automobile insurance coverage that restricts the collectible vehicle mileage or use, or both, and requires the owner to have another vehicle for personal use" (see HB 2357).

To verify that a vehicle qualifies for an exemption from testing and ensure that non-qualifying vehicles will continue to be tested, MVD, in cooperation with collectible vehicle insurers, will track the type of vehicle applying for registration. Insurers are required to notify MVD of any insurance policy cancellation or nonrenewal. In such an event, the statute requires MVD to "cancel the registration of the vehicle and the vehicle's exemption from emissions testing … unless evidence of coverage is presented to the Department of Transportation within sixty days" (see HB 2357).

The procedures for canceling a registration are straightforward. First, following the cancellation or nonrenewal of an insurance policy, the insurance company notifies the MVD of the policy termination within 7 days. Within 30 days of notification, a notice of intent to cancel the vehicle's registration is then sent to the owner by the MVD. If, after an additional 30 days the collectible vehicle insurance has not been renewed, a letter is sent informing the owner that the registration has been canceled and the vehicle no longer qualifies for the emissions testing exemption and can no longer be operated. Each vehicle's registration status is available to law enforcement personnel via electronic database.

Motor Vehicle Division procedures for tracking collectible vehicle insurance, emissions testing, and registration status are outlined in Appendix C.

2.2 Demonstrating Noninterference with Attainment and Maintenance Under CAA 110(l)

Revisions to SIP approved control measures must not interfere with requirements of the Clean Air Act (CAA) as outlined in CAA § 110 (l):

> "(l) Plan Revisions—Each revision to an implementation plan submitted by a State under this Act shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act."

Continued operation of I/M programs, are required under the anti-backsliding provisions of EPA's 8-hour ozone Phase I implementation rule. The primary pollutants affected by I/M programs are carbon monoxide (CO), hydrocarbons (HC) or volatile organic compounds (VOC), and to a lesser degree, oxides of nitrogen (NOx). Hydrocarbons and NOx are precursors for ground-level ozone formation. Oxides of nitrogen are also a presumptive precursor for particulate matter of size under 10 microns (PM2.5). The following sections evaluate the impact of collectible vehicle and motorcycle I/M exemptions on the ozone, PM2.5, and carbon monoxide air quality standards. Additionally, air toxics and transportation conformity are addressed.

2.2.1 Ozone

The Phoenix area attained the 1-hour ozone standard and was redesignated to a maintenance area

in 2005. In 2004 the area was classified as "basic" nonattainment for the new 8-hour ozone standard. EPA has not yet completed the rulemaking for implementation of the 8-hour standard; however, Phase I of the 8-hour implementation rule was issued in 2004. The rule addresses several of the 8-hour implementation program requirements, including revocation of the 1-hour ozone standard, attainment dates, and anti-backsliding provisions to maintain air quality improvements made during implementation of the 1-hour standard. Phase II of the 8-hour ozone implementation rule is expected in a future rulemaking to address reasonable further progress, attainment demonstrations, and reasonably available control measures and technology. As required, the I/M program established for attainment of the 1-hour ozone standard remains a component of the Arizona SIP to meet the anti-backsliding provisions of the Phase I rule. A full attainment analysis and planning process will be completed following promulgation of the Phase II rule.

Volatile organic compound emissions are one the primary pollutants that contribute to ozone formation. Table 2 presents the most current emissions inventory estimates for VOCs in Area A and Area B. On-road mobile emissions comprise 22 percent of total emissions in Area A and 36 percent of total emissions in Area B.

Table 2: Volatile Organic Compound Emissions Inventories

Source Category	Area A[6] (metric tons per day)	Area B [7] (metric tons per day)
Point	17.4	1.8
Area	101.4	22.9
Non-road mobile	61.0	11.4
On-road mobile	71.9	30.3
Biogenics	77.2	18.4
Total	328.9	84.8

The reduction of emissions due to the repair of vehicles that exceed the prescribed emissions standards contained in Arizona Administrative Code R18-2-1031 is called the I/M benefit. As presented in Table 3, the VOC emissions reduction benefit from testing and repair of collectible vehicles in Area A and Area B and motorcycles in Area B is less than 1 metric ton per day. The I/M benefits for subject vehicles are less than one half of one percent of both area-wide on-road emissions and total emissions and demonstrates that the exemption of collectible vehicles in Area A and Area B and motorcycles in Area B does not provide a significant benefit.

[6]Average Tuesday, August 2006, from *One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*, Maricopa Association of Governments, March 2004.

[7]Tons per day calculated from annual totals for 2003 (Pima Association of Governments, personal communication).

Table 3: I/M Benefits from Test and Repair of Collectible Vehicles and Motorcycles - Hydrocarbons (HC)[8]			
Vehicle Category	**Each Class Individually** (metric tons per day)	**Percent of Area-Wide On-Road Emissions**	**Percent of Area-Wide Total Emissions Inventory**
Area A			
Collectible Vehicles	0.03	0.04%	0.009%
Area B			
Collectible Vehicles	0.01	0.03%	0.012%
Motorcycles	0.03	0.10%	0.035%

Due to committed and implemented control measures, overall emissions of volatile organic compounds are projected to trend down through 2015. For Area A, on-road VOC emissions are expected to be reduced more than 50 percent between 1999 and 2015.[9]

The NOx emissions reduction benefit from testing and repair of collectible vehicles would be marginal. No NOx testing is performed on vehicles model years 1980 and older. The results of a survey of collectible vehicle owners show that 92.3 percent of collectible vehicles were model years 1980 and older while only 7.7 percent were model years 1981 or newer. For Maricopa County, the tested fleet included 3,800 collectible vehicles. This equates to only 293 collectible vehicles subject to NOx testing. Additionally, research has shown that engine repairs to reduce CO emissions can increase NOx emissions. It is reported that changes in HC and CO emission rates are positively related but both are inversely related to changes in NOx emissions. For example, enleaning the air-fuel ratio (i.e., a repair aimed at a CO emissions failure, which is usually associated with carburetion) will increase NOx emissions.[10]

Due to committed and implemented control measures, overall NOx emissions are projected to trend down through 2015. For Area A, on-road NOx emissions are expected to be reduced more than 50 percent between 1999 and 2015.[11]

As noted above, the Phoenix area was designated nonattainment for the 8-hour standard in 2004. The Tucson area is designated as attainment/unclassifiable. Tables 4 and 5 present the most recent quality assured ambient monitoring data and calculated design values for Area A and Area B for all sites with three years of monitoring through 2004. The highest calculated value is 106 percent of the NAAQS in Area A. The highest calculated value in Area B is 95 percent.

[8] See footnote 5, above.
[9] See *One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*, March 2004.
[10] See *Costs, Emissions Reductions, and Vehicle Repair: Evidence from Arizona, Resources for the Future*, Revised October 1999.
[11] See footnote 9, above.

Table 4: 2002-2004 Eight-Hour Ozone Compliance (in ppm) - Area A

NAAQS: The three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration is less than or equal to 0.08 ppm.

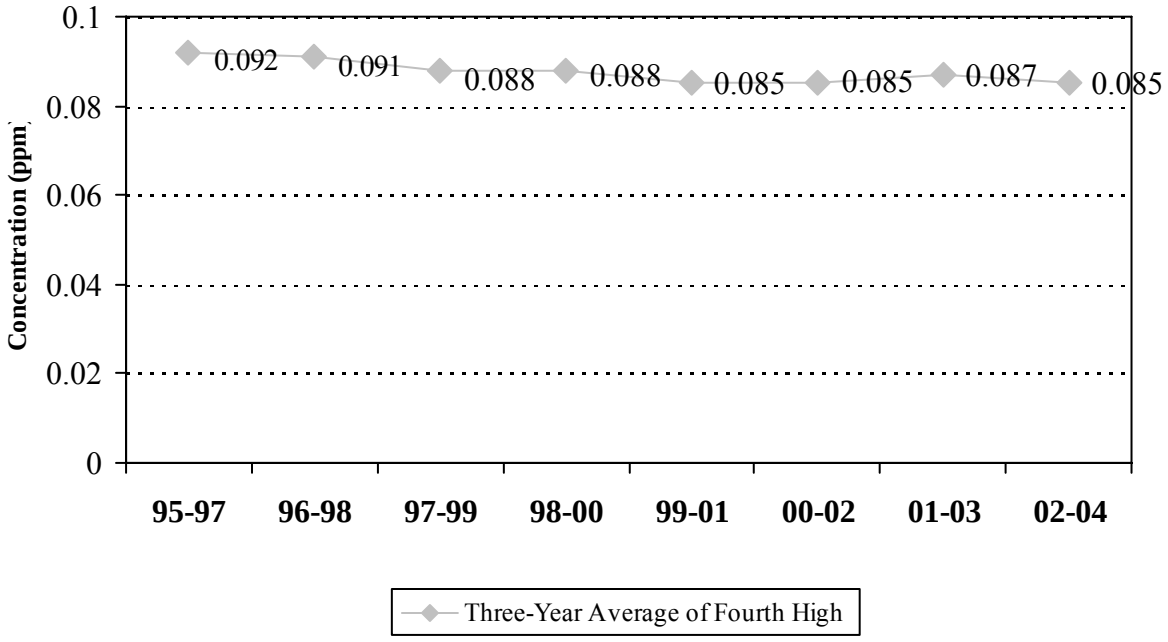
City or Site	Fourth-Highest Value			Three-Year Average
	2002	2003	2004	
Maricopa County				
Blue Point	0.086	0.086	0.075	0.082
Buckeye (Opened 08/01/04)	N/A	N/A	0.058	N/A
Cave Creek	0.086	0.083	0.076	0.081
Central Phoenix	0.076	0.079	0.074	0.076
Dysart	N/A	0.073	0.065	N/A
Falcon Field	0.084	0.079	0.070	0.077
Fountain Hills	0.086	0.083	0.075	0.081
Glendale	0.083	0.085	0.076	0.081
Humboldt Mt.	0.090	0.087	0.078	0.085
JLG Supersite	0.076	0.075	0.072	0.074
North Phoenix	0.085	0.086	0.080	0.083
Palo Verde	0.078	0.075	0.072	0.075
Pinnacle Peak	0.084	0.083	0.068	0.078
Rio Verde	0.085	0.083	0.074	0.080
South Phoenix	0.081	0.076	0.072	0.076
South Scottsdale	0.079	0.079	0.073	0.077
Tempe	0.080	0.080	0.072	0.077
West Chandler	0.083	0.078	0.070	0.077
West Phoenix	0.084	0.077	0.072	0.077
Pinal County				
Apache Junction - Maintenance Yard	0.079	0.072	0.069	0.073

Table 5: 2002-2004 Eight-Hour Ozone Compliance (in ppm) - Area B
NAAQS: The three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration is less than or equal to 0.08 ppm.

City or Site	Fourth-Highest Value			Three-Year Average
	2002	2003	2004	
Pima County				
22nd St. & Craycroft	0.075	0.073	0.069	0.072
Children's Park	0.073	0.076	0.068	0.072
Coachline	N/A	0.061	0.068	N/A
Green Valley	N/A	0.068	0.066	N/A
Rose Elementary	N/A	0.065	0.064	N/A
Saguaro NP East	0.077	0.078	0.073	0.076
Tangerine	0.075	0.074	0.068	0.072
Tucson Downtown	0.072	0.068	0.063	0.067
Tucson Fairgrounds	0.072	0.070	0.064	0.068

An examination of available data shows there is a general downward trend in monitored ambient ozone levels due to implementation of state and federal controls. Figure 1 illustrates the maximum calculated design value by year for Area A.

Figure 1: Maximum Three-Year Average of the Annual Fourth Highest 8-Hour Ozone Concentrations, Maricopa County, 1997-2004



2.2.2 PM2.5

Both the Phoenix and Tucson areas were designated attainment/unclassifiable for the PM2.5 air quality standards in 2004. Because of the negligible change in emissions due to the current revision to the I/M programs, no ambient impacts are expected. Tables 6 and 7 present ambient monitoring data and calculated compliance values for 2002 through 2004 for the annual $PM_{2.5}$ .standard. The highest calculated values are equal to or less than 77 percent of the NAAQS in Area A and 41 percent of the NAAQS in Area B.

Table 6: 2002-2004 Annual Average $PM_{2.5}$ Compliance (in µg/m^3) – Area A

NAAQS: The three-year average of annual means is less than or equal to 15 µg/m^3

City or Site Federal Reference Monitors	2002	2003	2004	Three-Year Average
Maricopa County				
JLG Supersite	11.63	11.27	9.73	10.9
Tempe Community Center	10.36	9.63	7.30	9.1
West Phoenix	12.57	10.68	11.60	11.6
Pinal County				
Apache Junction Fire Station	6.39	6.30	5.51	6.1

Table 7: 2002-2004 Annual Average $PM_{2.5}$ Compliance (in µg/m^3) – Area B

NAAQS: The three-year average of annual means is less than or equal to 15 µg/m^3

City or Site Federal Reference Monitors	2002	2003	2004	Three-Year Average
Pima County				
Children's Park	6.62	6.54	5.57	6.2
Orange Grove	6.36	6.45	5.79	6.2

Tables 8 and 9 present ambient monitoring data and calculated compliance values for 2002 through 2004 for the 24-hour $PM_{2.5}$ .standard. The highest calculated values are equal to or less than 48 percent of the NAAQS in Area A and 26 percent of the NAAQS in Area B.

Table 8: 2002-2004 24-Hour Average $PM_{2.5}$ Compliance (in µg/m^3) – Area A

NAAQS: The three-year average of the 98th percentile values is less than or equal to 65 µg/m3.

City or Site Federal Reference Monitors	98th Percentile			Three-Year Average
	2002	2003	2004	
Maricopa County				
JLG Supersite	31.9	24.2	27.6	28
Tempe Community Center	21.6	25.0	14.8	20
West Phoenix	36.2	25.9	29.9	31
Pinal County				
Apache Junction Fire Station	13.1	21.1	10.3	15

Table 9: 2002-2004 24-Hour Average $PM_{2.5}$ Compliance (in µg/m^3) – Area B

NAAQS: The three-year average of the 98th percentile values is less than or equal to 65 µg/m3.

City or Site Federal Reference Monitors	98th Percentile			Three-Year Average
	2002	2003	2004	
Pima County				
Children's Park	20.2	13.2	10.3	15
Orange Grove	21.5	15.9	13.3	17

2.2.3 Carbon Monoxide

The Tucson area was redesignated to attainment for the CO air quality standards in 2000. The Phoenix area attained the carbon monoxide standard and was redesignated to attainment in 2005. Carbon monoxide (CO) emissions can contribute to elevated ambient concentrations. Table 10 presents the most current emissions inventory estimates for CO in Area A and Area B. On-road mobile emissions comprise 76 percent of total emissions in Area A and 68 percent of total emissions in Area B.

Table 10: Carbon Monoxide Emissions Inventories		
Source Category	**Area A**[12] (metric tons per day)	**Area B**[13] (metric tons per day)
Point	21.9	7.2
Area	29.7	7.8
Non-road mobile	161.0	176.8
On-road mobile	699.7	406.7
Total	912.3	598.5

The reduction of emissions due to the repair of vehicles that exceed the prescribed emissions standards contained in Arizona Administrative Code R18-2-1031 is called the I/M benefit. As presented in Table 11 the CO emissions reduction benefit from testing and repair of collectible vehicles in Area A and Area B and motorcycles in Area B is less than 1 metric ton per day. The I/M benefits for subject vehicles are less than one half of one percent of both area-wide on-road emissions and total emissions and demonstrates that the exemption of collectible vehicles in Area A and Area B and motorcycles in Area B does not provide a significant benefit.

Table 11: I/M Benefits from Test and Repair of Collectible Vehicles and Motorcycles – Carbon Monoxide (CO)[14]			
Vehicle Category	**Each Class Individually** (mtpd)	**Percent of Area-Wide On-Road Emissions**	**Percent of Area-Wide Total Emissions Inventory**
Area A			
Collectible Vehicles	0.32	0.05%	0.035%
Area B			
Collectible Vehicles	0.14	0.03%	0.023%
Motorcycles	0.09	0.02%	0.015%

Due to committed and implemented control measures, overall emissions of carbon monoxide are projected to trend down through 2015. For Area A, on-road CO emissions are expected to be reduced more than 24 percent between 1999 and 2015.[15]

Because of the negligible change in emissions due to the current revision to the I/M programs, no ambient impacts are expected. Tables 12 and 13 present ambient monitoring data and calculated

[12]Average Friday, December 2006, from *Carbon Monoxide Resesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*, Maricopa Association of Governments, May 2003.
[13] See footnote 7, above.
[14] See footnote 5, above.
[15] See *Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*, May 2003.

compliance values for 2003 through 2004 for the 1-hour CO standard. The highest calculated values are equal to or less than 21 percent of the NAAQS in Area A and 27 percent of the NAAQS in Area B.

Table 12: 2003-2004 One-Hour Carbon Monoxide Compliance (in ppm) – Area A
NAAQS: The highest of the second-highest values in a two-year period must not exceed 35 ppm.
NOTE: Pinal County monitors closed in 2002.

City or Site	2003		2004		Design Value
	Max Value	2nd High	Max Value	2nd High	
Maricopa County					
Buckeye (Opened 09/01/2004)	N/A	N/A	0.9	0.9	N/A
Central Phoenix	5.9	5.4	5.0	4.4	5.4
Dysart	N/A	N/A	2.1	1.8	N/A
Glendale	5.7	3.5	6.1	3.2	3.5
Greenwood	6.8	6.8	7.6	7.3	7.3
JLG Supersite	6.7	6.0	4.9	4.9	6.0
Maryvale	5.8	5.7	5.7	5.0	5.7
Mesa	3.5	3.4	3.0	2.6	3.4
North Phoenix	4.0	4.0	4.1	3.7	4.0
South Phoenix	5.8	5.5	6.7	5.9	5.9
South Scottsdale	4.1	4.0	3.4	3.1	4.0
Tempe	3.8	3.7	3.1	2.6	3.7
West Chandler	3.9	3.3	2.9	2.7	3.3
West Indian School	6.8	6.8	6.9	6.7	6.8
West Phoenix	7.5	7.3	7.7	7.5	7.5

Table 13: 2003-2004 One-Hour Carbon Monoxide Compliance (in ppm) – Area B
NAAQS: The highest of the second-highest values in a two-year period must not exceed 35 ppm.
NOTE: Pinal County monitors closed in 2002.

City or Site	2003		2004		Design Value
	Max Value	2nd High	Max Value	2nd High	
Pima County					
22nd St. & Alvernon	6.0	5.8	4.0	4.0	5.8
22nd St. & Craycroft	4.4	4.3	3.6	3.4	4.3
Cherry & Glenn	4.2	3.9	4.0	3.9	3.9
Children's Park	2.4	2.3	2.2	2.2	2.3
Golf Links & Kolb	3.9	3.8	3.6	3.5	3.8
Tucson Downtown	10.0	9.6	5.5	4.7	9.6

Tables 14 and 15 present ambient monitoring data and calculated compliance values for 2003 through 2004 for the 8-hour CO standard. The highest calculated values are equal to or less than 61 percent of the NAAQS in Area A and 30 percent of the NAAQS in Area B.

Table 14: 2003-2004 Eight-Hour Carbon Monoxide Compliance (in ppm) – Area A
NAAQS: The highest of the second-highest values in a two-year period must not exceed 9 ppm.
NOTE: Pinal County monitors closed in 2002.

City or Site	2003		2004		Design Value
	Max Value	2nd High	Max Value	2nd High	
Maricopa County					
Buckeye (Opened 09/01/2004)	N/A	N/A	0.5	0.4	N/A
Central Phoenix	4.6	3.8	3.4	3.3	3.8
Dysart	N/A	N/A	1.1	1.1	N/A
Glendale	2.4	2.3	2.4	2.1	2.3
Greenwood	5.4	5.1	4.9	4.3	5.1
JLG Supersite	4.8	4.2	4.2	4.0	4.2
Maryvale	4.2	4.1	3.5	2.9	4.1
Mesa	2.5	2.2	1.7	1.7	2.2
North Phoenix	2.3	2.1	2.2	2.0	2.1
South Phoenix	3.6	3.3	3.5	3.3	3.3
South Scottsdale	2.3	2.2	2.4	2.4	2.4
Tempe	2.9	2.4	1.9	1.7	2.4
West Chandler	2.6	2.6	2.1	2.1	2.6
West Indian School	5.4	5.3	4.7	4.6	5.3
West Phoenix	6.2	5.5	5.2	5.1	5.5

Table 15: 2003-2004 Eight-Hour Carbon Monoxide Compliance (in ppm) – Area B
NAAQS: The highest of the second-highest values in a two-year period must not exceed 9 ppm.
NOTE: Pinal County monitors closed in 2002.

City or Site	2003		2004		Design Value
	Max Value	2nd High	Max Value	2nd High	
Pima County					
22nd St. & Alvernon	2.7	2.6	2.1	2.0	2.6
22nd St. & Craycroft	2.1	1.9	1.6	1.6	1.9
Cherry & Glenn	2.9	2.7	2.7	2.2	2.7
Children's Park	1.5	1.4	1.4	1.4	1.4
Golf Links & Kolb	2.2	2.2	2.1	2.1	2.2
Tucson Downtown	3.1	2.7	3.7	2.5	2.7

2.2.4 Transportation Conformity

Maricopa Region[16]

The federal transportation conformity rule outlines criteria and procedures for ensuring that transportation projects, programs, and plans do not cause or contribute to violations of the federal air quality standards.[17] To evaluate the impact of these projects, a regional emissions analysis is performed on transportation improvement programs (TIP) and regional transportation plans (RTP) to determine conformance with air quality state implementation plans. The conformity rule applies to "all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan."[18]

Portions of Maricopa County are designated as a maintenance area for carbon monoxide. Portions of Maricopa County and Apache Junction in Pinal County are designated as nonattainment areas for particulate matter of size under 10 microns (PM10) and 8-hour ozone. Federal law requires that the boundaries of the metropolitan planning area include at least the boundaries of the nonattainment or maintenance areas as created by the CAA. Therefore Apache Junction is included in the metropolitan planning area and their transportation projects are included in the regional transportation improvement plan. The Maricopa Association of Governments (MAG), the Metropolitan Planning Organization for the Maricopa County region, performs conformity analyses to determine whether future regional transportation projects are expected to adversely affect attainment or maintenance of the air quality standards for these pollutants.

Two types of conformity tests are specified in the federal transportation conformity rule: the emissions budget test, and interim emissions tests. For the emissions budget test, predicted emissions for the TIP and RTP must be less than or equal to the motor vehicle emissions budget contained in the approved air quality implementation plan. If there is no approved air quality plan for a pollutant for which the region is in nonattainment and no emission budget established for that pollutant (and approved by EPA), interim emission tests apply.

The most recent transportation conformity determination by the U.S. Department of Transportation for the *2005 MAG Conformity Analysis for the FY 2006-2010 Transportation Improvement Program and Regional Transportation Plan - 2005 Update* occurred on August 31, 2005. The conformity analysis used the latest planning assumptions to develop on-road mobile source emissions of CO, VOC, NOx, and PM10 for 2006, 2009, 2015, 2016, and 2026. These emissions were compared with conformity budgets from applicable State Implementation Plans and subjected to other interim emissions tests as prescribed by EPA.

EPA approved the 2006 conformity budget for PM10 in the *Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area*, February 2000. The 2006 and 2015 conformity budgets for CO were approved in the *Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*, May 2003. The VOC and NOx budgets for 2006 and 2015 were approved in the *One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*, March 2004. Adjusted one-hour ozone budgets were applied as an eight-hour ozone budget test. The one-hour budgets were adjusted to remove the VOC and NOx emissions attributable to vehicle travel by

[16] Source: *2005 MAG Conformity Analysis for the FY 2006-2010 Transportation Improvement Program and Regional Transportation Plan - 2005 Update*, May 2005; Maricopa Association of Governments.
[17] See 40 CFR Parts 51 and 93.
[18] See 40 CFR 93.102.

residents of the Gila River Indian Community. In addition, an interim emissions test for eight-hour ozone was performed to compare future VOC and NOx emissions estimates with 2002 baseline emissions for the eight-hour ozone nonattainment area. The conformity budgets/tests and associated emissions estimates from the latest conformity analysis are summarized in Appendix D.

Table 2.2 of *Report on Potential Exemptions from Vehicle Emissions Testing fro Motorcycles, Collectible Vehicles and Vehicles 25 Model Years Old and Older* (see Appendix B) quantifies the emissions benefits of collectible vehicles participating in the I/M test and repair program. The I/M benefit for all collectibles in Area A is estimated to be 0.034 metric tons per day for HC and 0.319 metric tons day for CO in 2003 (Note that HC is equivalent to VOC in the MOBILE6.2 model runs). Comparing 2003 emissions with emissions for conformity analysis years (i.e., 2006, 2009, 2015, 2016, and 2026) is a conservative assumption, because the impact of I/M on mobile source emission rates diminishes over time; the emissions control equipment in the newer model vehicles deteriorates less rapidly than in older vehicles.

According to Table 2.2, removing collectible vehicles from the I/M program would increase VOC emissions by 0.034 metric tons per day. Because conformity emissions estimates and budgets are rounded to the nearest tenth of a metric ton, the estimated increase in VOC would have a very small impact on the conformity emissions for any analysis year. Tables 16 and 17 illustrate conformity analysis results for VOCs compared to the VOC I/M benefit in 2006.

Table 16: Volatile Organic Compounds (VOC) No-Greater-than-Baseline Emissions Test for the Eight-hour Ozone Nonattainment Area and I/M Benefit (metric tons per day)[19]	
2002 Baseline	84.5
2006 Emissions	64.2
Collectible Vehicle I/M Benefit	0.03
Total Emissions (2006 + I/M benefit)	64.23
Increase in Emissions for I/M Benefit	0.05%

Table 17: Volatile Organic Compounds (VOC) Adjusted One-Hour Ozone Budget Test for the Eight-hour Ozone Nonattainment Area and I/M Benefit (metric tons per day)[20]	
2006 Adjusted Budget	71.9
2006 Emissions	60.3
Collectible Vehicle I/M Benefit	0.03
Total Emissions (2006 + I/M benefit)	60.33
Increase in Emissions for I/M Benefit	0.05%

Increasing CO emissions by 0.319 metric tons per day would result in a slight increase in emissions, but would not change the overall conformity finding, because CO emissions for all future years are well below the applicable CO budgets. Table 18 illustrates conformity analysis results for CO compared to the CO I/M benefit in 2006.

[19] See Appendices B and D and *2005 MAG Conformity Analysis for the FY 2006-2010 Transportation Improvement Program and Regional Transportation Plan - 2005 Update*, May 2005. .
[20] See footnote 19, above.

Table 18: Carbon Monoxide (CO) Conformity Budget Test for the Carbon Monoxide Nonattainment Area and I/M Benefit (metric tons per day)[21]	
2006 Budget	699.7
2006 Emissions	542.8
Collectible Vehicle I/M Benefit	0.32
Total Emissions (2006 + I/M benefit)	543.12
Increase in Emissions for I/M Benefit	0.06%

The NOx reduction attributable to the I/M program for collectible vehicles is not shown in Table 2.2, but comparable MOBILE6.2 runs indicate that the NOx emissions rate in grams per mile would be less than 25 percent of the VOC emissions rate in 2003. However, given that only approximately seven percent of collectible vehicles are subject to NOx testing, the NOx benefit would equate to approximately two percent of the VOC benefit in 2003. Therefore, the NOx emissions increase for all conformity years would be undetectable at the tenth-of-a-ton precision used in conformity. MOBILE6.2 does not assign any PM10 emissions reduction credit for I/M and therefore, removing collectible vehicles from I/M would not increase conformity emissions for PM10.

In summary, removing collectible vehicles from the I/M program will result in a small increase in CO emissions, very small increases in VOC and NOx emissions, and no increase in PM10 emissions.

Pima County[22]

The Tucson area in Pima County has not violated the CO NAAQS since 1984, and is projected to maintain compliance with the CO standards for at least ten years. EPA promulgated a final rule on April 24, 2000, to redesignate the Tucson Air Planning Area (TAPA) to attainment for CO and to approve a maintenance plan that insures that the area remains in attainment. Approval of the *Carbon Monoxide Limited Maintenance Plan for the Tucson Air Planning Area* (CO LMP) became effective July 10, 2000. The plan relies on monitoring and modeling procedures to predict when emissions control measures should be added or removed. Air quality modeling currently indicates that the area will maintain the CO NAAQS for at least 10 years without implementing any additional CO transportation control measures (TCMs) or system improvements. EPA confirmed in the rule that no emissions budget test is needed to demonstrate conformity as long as procedures in the maintenance plan are followed and no violations of the CO NAAQS occur. The Pima Department of Environmental Quality (PDEQ) is the designated air quality control agency for Pima County and is responsible for monitoring ambient CO levels.

The Clean Air Act Amendments of 1990 require that the RTP conform to the "applicable air quality implementation plan's" (SIP's) purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. Prior to 2000, the Tucson region was designated nonattainment for the CO health standard. As a nonattainment area, an emissions budget (i.e., maximum emissions limit) was required and assumed to be 1990 base year levels. Nonattainment status also required that federally supported transportation plans, programs, and projects not adversely affect air quality. A conformity determination on short and long-range plans included modeling results showing that future on-

[21] See footnote 19, above.

[22] Source: *2006-2010 Transportation Improvement Program* and *2030 Regional Transportation Plan*; Pima Association of Governments.

road mobile emissions from motor vehicles did not exceed those of the base year. Approval of the LMP in July 2000 removed the conformity determination requirement for an emissions cap. However, modeling of the regional CO emissions is used for comparative purposes and compliance is determined by monitoring of the existing system.

The Tucson area continues to be in attainment for the health based standard for CO under the LMP. The region currently monitors ambient CO levels that are less than a quarter of the standard. Federal Tier 2 new vehicle standards and vehicle fleet turnover have helped to significantly reduce CO emissions in the region. These low readings serve to reinforce that CO is no longer considered a health issue in the Tucson metropolitan area.

The regional CO emissions impact from motor vehicles was analyzed for year2030 RTP projects. Outputs from the transportation model, TP+, and the air quality model, MOBILE6.2, were utilized by Pima Association of Governments (PAG) air quality planning staff to estimate the CO emissions from motor vehicles for the start year, as well as the 2030 scenario for the transportation network.

Vehicle miles traveled (VMT) and speed data for six facility categories were consolidated into two categories, freeways and arterials, for air quality modeling of CO emissions. It is assumed that the local/off-system collectors carry 13 percent of the on-system VMT, at a speed of 12.9 miles per hour (the MOBILE6.2 average speed for local streets). Separate arterial and freeway model runs were done at the estimated average speed. High and low altitude scenarios were averaged to reflect the Tucson elevation. The model run inputs also included local vehicle registration and climate data, a winter-time oxyfuel level of 1.8 percent, with the Vehicle Emissions Inspection Program, and a Reid Vapor Pressure of 11.1 psi (actual winter 2004/05 average). The MOBILE6.2 model takes into account regulatory changes that affect the outputs, particularly the new Tier 2 and gasoline sulfur regulations. Tier 2 standards require stricter tailpipe emissions that are being phased in over the period 2004-2007 for new cars and 2006-2009 for new light duty trucks.

Table 19 is a summary of the modeling results. The CO emissions benefit provided by the Tier 2 emissions standards with fleet turnover is evident from the regional CO emissions estimates. This benefit, together with changes in average travel speeds by roadway type and the corresponding emission factors, outweigh the significant increase in VMT from 2005 to 2030.

Table 19: Summary of Regional CO Emissions Modeling Results – Pima County Region (Area B)

Year	Total Vehicle Miles Traveled (mi/day)	Average Freeway Speed (mph)	Average Arterial Speed (mph)	Regional CO Emissions (tons/day)
2005	21,880,000	55.8	35.1	380
2030	42,670,000	39.7	31.8	298

Source: PAG Regional Air Quality Model

In order for PAG and the U.S. Department of Transportation to determine that the RTP is in conformity with the applicable SIP, the RTP must meet the conformity requirement findings in Arizona Administrative Code R18-2-1401 et seq. Based on regional monitoring results and staff emissions estimates, the following three conformity findings are appropriate:

- The RTP provides for, or does not impede, the implementation of all transportation

control measures in the applicable SIP on the schedule set forth in the SIP.

- CO emission levels, microscale and regional, resulting from implementation of the RTP will not interfere with maintenance of the CO NAAQS throughout the maintenance area during the period covered by the plan.

- Implementation of the RTP program will not cause or contribute to a violation of the CO NAAQS anywhere within the maintenance area during the period covered by the plan.

In conclusion, CO concentrations have consistently declined over the past 20 years. The EPA 2003 Trends Report states that between 1992 and 2001, ambient CO concentrations decreased 38 percent. This air quality improvement occurred despite an approximately 35 percent increase in VMTs in the United States during this 10-year period and similar trends for CO have been seen in the PAG region. In order to ensure compliance with the federal health standards, continuing current programs to promote the use of alternate modes of transportation and clean fuels are an important regional component for maintaining air quality.

2.2.5 Air Toxics

There are no ambient air quality standards for air toxics, therefore, compliance with applicable maximum achievable control technology (MACT) standards, as well as any Federal mobile source control requirements under CAA sections 112 or 202(l) demonstrate noninterference for air toxics in the program area. Motor vehicles are not subject to MACT standards and this SIP revision does not interfere with any federal mobile source control requirements that apply in the area. Arizona thus concludes that this SIP revision will not interfere with any applicable air toxics requirements of the CAA.

3.0 Conclusion

Because the analyses of the impacts of exempting collectible vehicles in Areas A and B and motorcycles in Area B shows a minimal impact on emissions, less than 1 metric ton per day, and represents a fraction of the overall emissions inventories in Areas A and B, ambient impacts in both areas are expected to be negligible. Exempting these vehicles from testing will not interfere with continued maintenance of the NAAQS and does not impact these areas' ability to maintain the CO and ozone NAAQS.

With this submittal, ADEQ requests that the changes to Arizona's basic and enhanced vehicle emissions inspection and maintenance programs, as presented in this document, be approved as a component of Arizona's SIP.